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Environmental Working Group
Interim Draft Phase 1B Report

August 15, 2008

Summary

RETI's goal is to identify electric transmission facilities needed to provide access to areas which can provide renewable energy most cost effectively and with the least impact to the environment.[1] In addition to the economic assessment of competitive renewable resource zones (CREZs) being performed for RETI by Black and Veatch[2] in Phase1, the RETI Stakeholder Steering Committee (SSC) at its March 19, 2008 formed an Environmental Working Group (EWG) to make recommendations regarding consideration of environmental issues to enable the SSC to meet its goals.

The EWG is chaired by Johanna Wald of the Natural Resources Defense Council (NRDC) and Carl Zichella of the Sierra Club, the two environmental representatives on the SSC, and meets weekly via Internet and teleconference links. Voting representation on the EWG is limited to SSC members, but meetings and discussions are open to all interested parties. Decisions are made by consensus of the participants to the extent possible. The EWG maintains an active email list of approximately 50 RETI participants, and materials are posted on the RETI web site.

This chapter describes the work by RETI's Environmental Working Group to identify those CREZs in which:

1. Energy development is prohibited or severely restricted by existing law or policy; and
2. Renewable energy development is expected to be least damaging to the environment.

In addition, this chapter describes the process by which the dual goals of minimizing economic costs and environmental impacts will be integrated.

The assessment performed by the EWG of potential environmental impacts associated with energy development in CREZs is intended to provide guidance to RETI on the relative merits of development in these areas and not the merits of individual projects. The EWG did not consider specific issues related to any individual project which may be proposed to be developed in the CREZs or elsewhere. Moreover, the EWG's assessment of CREZs was limited to issues for which statewide data were available. Individual projects must undergo site-specific environmental review by the appropriate permitting agency on all issues of potential significance as required by law; the EWG's CREZ assessments may not reflect the actual environmental benefits or issues respecting any individual projects or sites.

The process of identifying CREZs in which development is expected to have the least environmental impacts (Task #2) has not been completed, and preliminary results are not included in this report. A subsequent report currently scheduled for release on September 5, 2008, will include these results.

[1] RETI Mission Statement: http://www.energy.ca.gov/reti/Mission_Statement.pdf
[2] Phase 1A report: http://www.energy.ca.gov/reti/documents/index.html

Restricted Areas

A variety of federal, state, and local policies restrict commercial energy development in certain areas. These policies serve to protect special environmental features by steering development elsewhere. In some areas, identified by the EWG as Category 1 Lands, such restrictions are absolute. Commercial energy development in national parks, for example, is absolutely prohibited. In other areas, referred to as Category 2 Lands, some development may be permitted but restrictions impose significant limits. Lands in both categories and the legal basis for the restrictions are described below. The Bureau of Land Management (BLM) and the U.S. Forest Service (USFS) are currently considering adopting new policies for renewable energy development on lands within their respective jurisdictions. Final adoption of such policies may warrant reconsideration of the assumptions and decisions made here.

As described by Black & Veatch[3] no potential energy development in Category 1 Lands has been considered. For Category 2 Lands, Black & Veatch has limited potential development to pre-identified projects which are assumed not to conflict with the policies governing these areas. For lands which are not in either Category 1 or 2, Black & Veatch has identified "proxy projects" as placeholders for likely future development as well as pre-identified projects.[4]

It should be noted that prohibitions and restrictions on energy development may nevertheless allow transmission rights-of-way to be permitted in some areas. Only potential energy development has been considered in RETI Phase 1 and in this report.[5] Environmental issues associated with transmission projects will be considered in RETI Phases 2 and 3.

Rating Criteria and Data

In addition to identifying areas in which energy development is prohibited or restricted, the EWG identified seven criteria which serve as indicators of potential environmental impacts likely to be associated with renewable energy development in a CREZ. These criteria consider the amount of land needed for development of energy projects and associated transmission facilities; existing land disturbance; proximity to protected areas; and wildlife abundance and corridors. The criteria used by the EWG are described in detail below.

Some of the rating criteria, such as the area impacted by development, rely on assessments performed by Black & Veatch described earlier. Other criteria rely on data that have been quantified by an appropriate federal, state, or local agency in publicly available data sets. Data sources are also identified below.

Although the EWG agreed that disturbance of lands relatively unaffected by human activity is an impact that should be captured by CREZ rating criteria, the EWG could not agree on a suitable definition of "disturbed lands." The key issue to be resolved is the extent to which certain agricultural lands should be counted as disturbed, and the EWG seeks guidance from the SSC on this issue.

Environmental impacts associated with biomass projects are primarily associated with production, collection and transportation of fuels for which no acceptable data exists. Biomass CREZs are therefore not included in the EWG ranking process. The EWG also was unable to consider any CREZ located outside California for lack of sufficient data. The EWG has not yet considered any CREZ located outside California and recommends to the SSC that assessment of those CREZs and integration of the results be pursued as soon as feasible.

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[3] Black & Veatch Phase 1A Report: [http://www.energy.ca.gov/reti/documents/index.html]

[4] Black & Veatch Phase 1A Report: [http://www.energy.ca.gov/reti/documents/index.html]

[5] The amount of land needed for associated transmission rights-or-way, as estimated by Black & Veatch, is included as a criterion for estimating potential environmental impacts of development, however.

CREZ Rating Formulas

For each of the rating criteria, the EWG developed a formula which uses appropriate data to provide a numerical value that is indicative of the relative magnitude of the potential environmental impact associated with each criterion in each CREZ. Each of the formulas used by the EWG to evaluate potential impacts associated with CREZ development is described below. For example, the formula used to quantify the relative impact associated with transmission infrastructure for a CREZ is:

Acres of new transmission right-of-way ÷ Gigawatt-hours[6] of energy produced per year.

CREZ Ranking Scores

In order to provide a uniform ranking system for all criteria, a relative score between 1 and 5 was assigned to each CREZ for each criterion. These scores were assigned on the basis of the percentage quintile in which the raw score provided by the rating formula lies. That is, the 20% of the CREZs with the lowest values for a criterion were assigned the score 1. The second lowest 20% were assigned the score 2, and so forth.

To obtain a total score for each CREZ, the individual scores for each criterion were added. Lower total scores are associated with CREZs in which potential environmental impacts are expected to be least, and higher scores indicate the likelihood of more severe environmental impacts. With seven criteria, the best possible score is 7 and the worse is 35.

Environmental "Supply Curve"

The total ranking score for each CREZ can be thought of as a measure of the relative environmental "cost" of potential energy development in the CREZ, analogous to the relative economic cost estimated for each CREZ by Black & Veatch. There has been no attempt to monetize the proxy environmental "costs" represented by the ranking scores. The scores are simply estimates of the magnitude of relative environmental impacts associated with the potential development of CREZs.

The environmental ranking scores were combined with the expected annual energy output for each CREZ to obtain an environmental "supply curve" analogous to the economic supply curve obtained by Black & Veatch.[7] Those CREZs having the lowest ranking scores and sufficient to provide the additional annual renewable energy required by California policies (plus an allowance for uncertainty) are considered by EWG to have passed the environmental "screen" as the environmentally preferred CREZs for development. The annual energy "cut-off" used by the EWG screen was identical to that used by Black & Veatch, XXX gigawatt-hours.[8]

Integrating Economic and Environmental Rankings

Since economic costs and environmental "costs" are incommensurate, the proverbial "apples and oranges" problem, a methodology was required to identify those CREZs which *simultaneously* minimize economic costs to consumers and impacts to the environment.

All CREZs which have been identified as preferred for low economic cost *and* for low environmental impacts on the basis of the two supply curves, i.e. those CREZs which pass both the economic and environmental screens, will be deemed to merit consideration for transmission access in Phase 2 of the RETI process. As of this writing the methodology for prioritizing additional CREZs which pass the economic screen but not the environmental screen,

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[6] One gigawatt-hour equals one million kilowatt-hours.

[7] See B&V supply curve in Phase 1B Report: [http://www.energy.ca.gov/reti/documents/index.html]

[8] See B&V discussion of net short plus error margin (in Phase 1A) and Phase 1B Final Report: [http://www.energy.ca.gov/reti/documents/index.html].

or *vice versa,* has not been developed, and further assessment by Black & Veatch and the EWG is required.

Unresolved Issues and Recommendations

In the process of identifying potential impacts which could be evaluated and used for prioritizing CREZ development, the EWG was limited to using readily available statewide data and clear policy direction. Unfortunately, the EWG was forced to ignore some important issues for which acceptable data was unavailable. In addition, the EWG identified issues for which existing state policies appear to conflict. The EWG recommends that SSC members and their respective institutions address the gaps that exist in relevant data and to resolve policy conflicts.

These issues are described below. As a result of its analysis, the EWG makes the following recommendations to improve future assessments:

1. Consistent statewide scenic quality data should be developed so that visual impacts associated with energy development can be included as a criterion for assessing CREZs;
2. Statewide data on Native American cultural sites should be collected and formatted for ready access, and a methodology should be developed for consideration of potential impacts on these sites by CREZ development;
3. Assessment of the CREZs outside of California and integration of the results should be pursued as soon as feasible;
4. The SSC is urged to consider the appropriateness of converting certain agricultural lands to energy development.

In addition, the EWG notes that environmental issues related to new transmission facilities needed to provide access to preferred CREZs have not been considered in Phase 1 of RETI but will be considered in Phases 2 and 3. The EWG therefore recommends that the SSC direct it to develop data and methodologies for assessing the environmental impacts of proposed transmission facilities as these are identified in Phases 2 and 3.

Conclusions

Despite limitations, the methodology developed by the EWG and approved by the SSC described here provides a coherent and consistent means of estimating the relative environmental impacts associated with potential energy development in the California CREZs identified by Black & Veatch. In addition, it enables economic and environmental considerations to be integrated through the dual supply curve approach.

This report describes the methodology developed by the EWG for ranking CREZs according to potential environmental concerns but does not include the results. The environmental ranking process will be completed by the EWG using the draft CREZs delineated by Black & Veatch, and the results will be reported September 5, 2008.

The next report will also identify CREZs in which renewable energy development is expected to minimize *both* economic costs and environmental impacts. CREZs identified as preferred in both the economic and environmental ranking will be considered for transmission access in RETI Phases 2 and 3. In addition, a methodology will be developed to identify the remaining CREZs needed to meet the state's energy goals which pass one screen but not the other. To the extent feasible, all the CREZs to be considered in Phases 2 and 3 will be identified in the next report.

Identification of Lands in Which Development is Restricted

A variety of federal, state, and local policies restrict commercial energy development in certain areas. These policies serve to protect special environmental features by steering development elsewhere. In some areas, identified by the EWG as Category 1 Lands and mapped in black, such restrictions are absolute. Commercial energy development in national parks, for example, is absolutely prohibited. In other areas, referred to as Category 2 Lands and mapped in yellow, some development may be permitted but restrictions impose significant limits. Lands in both categories and the legal basis for the restrictions are described below.

As described by Black & Veatch[9] no potential energy development in Category 1 Lands has been considered. In Category 2 Lands, Black & Veatch has limited potential development to pre-identified projects which are assumed not to conflict with the policies governing these areas.

It should be noted that, in some areas, prohibitions and restrictions on energy development may nevertheless allow transmission rights-of-way.

Only potential energy development has been considered in RETI Phase 1 and in this report.[10] Environmental issues associated with transmission projects will be considered in RETI Phases 2 and 3.

This section identifies areas in which energy development is prohibited or restricted by law or policy, referred to as Category 1 and Category 2 lands respectively.

Category 1 Lands

Category #1 — Areas where law or policy currently prohibits renewable development (mapped as black areas)

- **Designated federal Wilderness Areas and Wilderness Study Areas (WSAs)** – the former are designated by Congress, the latter by the BLM. In both areas, there are no roads and the "hand of man" is not visible. Wilderness Areas' values of solitude, natural quiet, and "wildness" as well as their non-motorized recreation opportunities and scenery are all intended to be preserved forever. In WSAs those values are to be preserved until Congress determines otherwise. In general, roads, machines, power tools are prohibited.
- **California State Wilderness Areas** – Public Resources Code Section 5019.68 declares that state wildernesses "are hereby recognized as areas where the earth and its community of life are untrammeled by man and where man himself is a visitor who does not remain." A state wilderness is further defined to mean an area of relatively undeveloped state "without permanent improvements or human habitation." Wilderness Act 5093.30-5093.40. These areas also are intended to be preserved in perpetuity.
- **Units of the National Park System** – established by Congress to conserve outstanding resources – both natural and historic – of importance to the nation. Management must preserve the values for which each unit was designated from degradation for the enjoyment of present and future generations. These units include, in addition to national parks, national monuments and national preserves managed by the National Park Service as well as national recreation areas and national historic parks.
- **USFS Inventoried Roadless Areas** – established by the USFS to preserve roadless areas on the National Forests and the ecological services and social values that are associated with those areas. In general, road construction and logging are prohibited.

[9] See Black & Veatch Phase 2 report: [http://www.energy.ca.gov/reti/documents/index.html]

[10] The amount of land needed for associated transmission rights-or-way, as estimated by Black & Veatch, is included as a criterion for estimating potential environmental impacts of development.

- **National historic and scenic trails** – designated by Congress as parts of the National Trails System. National scenic trails are long-distance (over 100 miles each), and national historic trails commemorate major, nationally significant routes of historic (and pre-historic) travel in the US. Both must provide for significant outdoor recreation.
- **National wild, scenic and recreational rivers** – free flowing streams that are mostly inaccessible, scenic and primitive and that possess "outstandingly remarkable values" such as scenery, recreation, fish and wildlife, historic. All such rivers are designated by Congress.
- **National Wildlife Refuges** - The U.S. Fish and Wildlife Service (FWS) manages the National Wildlife Refuge System. In accordance with the National Wildlife Refuge System Administration Act of 1966, as amended (16 U.S.C. §§ 668dd-668ee), the Secretary may permit the use or grant an easement in, over, across, upon, through, or under any areas within the System, whenever determined that such uses are "compatible with the purposes for which these areas are established. These are to: (1) maintain biological integrity, diversity, and environmental health of the refuge system and (2) facilitate compatible wildlife-dependent recreation." There are a total of 51 National Wildlife Refuges and Wildlife Management Areas covering 2.3 million acres in CA, NV and the Klamath Basin of Oregon, but it appears that few of them would potentially be affected by RETI. See: [http://www.fws.gov/cno/refuges/planning/index.cfm]
- **California state parks –** California state parks contain the largest and most diverse natural and cultural heritage holdings of any state agency in the nation. According to Public Resources Code section 5002, the State Park System consists of all parks, public camp grounds, monument sites, landmark sites, and sites of historical interest established or acquired by the State, or which are under its control. Further, section 5001.65 declares that commercial exploitation of resources in units of the state park system is prohibited.
- **DFG wildlife areas and ecological reserves** – uses of these Department of Fish and Game (DFG)-managed areas are restricted to those "compatible with wildlife values." Energy development is not allowed on these lands (exception might be geothermal, drilled from outside the reserves). Some reserves have existing easements for transmission which may allow upgrades with mitigation (additional lands purchased). DFG may also require undergrounding transmission lines in some circumstances.
- **BLM National Conservation Areas -** specifically: King Range National Conservation Area, Black Rock-High Rock National Conservation Area, and Headwaters Forest Reserve. These areas were designated by Congress to protect and preserve the unique, sensitive and/or important natural and historic resources of each, such as scenery, habitat for significant numbers of endemic plant and animal species and/or archeological values.
- **Lands precluded from development in Habitat Conservation Plans** –The purpose of the habitat conservation planning process is to ensure that there is adequate minimizing and mitigating of the "incidental take" of the significant species involved. While early plans were typically project-specific, more recent plans are broad-based, landscape level plans utilized to achieve long-term biological and regulatory goals. Once the plan and the permit are approved by county officials and state and federal agencies, it becomes a binding document. Only approved plans were included in this analysis. Once the plan and the permit are approved, private property owners (and other non-federal actors) can proceed with actions that would otherwise result in the illegal take of species. Environmental analysis and public participation are required in the development of these plans (except for plans with "minor effects" on species involved and their habitats). Participating landowners receive a "no surprises" commitment from the FWS, assuring

them that, if unforeseen circumstances arise, they will not need to make additional commitments of money or land, or face additional restrictions.

Lands that preclude development within an HCP include, but are not limited to, lands that have been protected by conservation easement or deed within the meaning of Civil Code section 815 *et seq*., or by conveyance to any agency or organization authorized to hold a conservation easement or deed under Civil Code section 815 *et seq*., in accordance with the terms of an HCP or NCCP.

- (Note: for Black & Veatch's analysis all HCP conservation reserves were counted as Category 2 lands because the restrictions on development are unique to the individual plan and could not be assessed in detail for that analysis, However the FWS will help the EWG categorize HCPs into hard and soft line reserves for the criteria 4 and 5 of the environmental ranking.)**Lands precluded from development under Natural Community Conservation Plans –** developed under California state law, each plan "identifies and provides for the regional or area-wide protection of plants, animals, and their habitats while allowing compatible and appropriate economic activity." CA Department of Fish and Game. 2008. "The program seeks to anticipate and prevent the controversies and gridlock caused by species' listings by focusing on the long-term stability of wildlife and plant communities and including key interests in the process." Id. There are 32 active NCCPs covering more than 7 million acres of which 11 have been approved and permitted.

  (Note: for Black & Veatch's analysis all NCCP conservation reserves were counted as Category 2 lands because the restrictions on development are unique to the individual plan and could not be assessed in detail for that analysis, However the EWG will categorize NCCPs into hard and soft line reserves for the criteria 4 and 5 of the environmental ranking.)
- **Private preserves of The Wildlands Conservancy (TWC)** – private land areas that are owned and managed by TWC for public benefit and use. TWC manages six preserves in California: http://www.wildlandsconservancy.org/twc_preserve.html. These lands are different from lands managed under conservation easements.
- **BLM national monuments –** established by presidents to protect and preserve the unique, sensitive and/or important natural and historic resources of each designated area, such as scenery, habitat for significant numbers of endemic plant and animal species and/or archeological values.
- **Existing conservation and mitigation banks under conservation easements approved by the DFG, FWS or Army Corps of Engineers** – conservation areas generally protect endangered and threatened species; mitigation areas are specifically for wetland restoration, creation and enhancement. The latter are undertaken to compensate for unavoidable wetland losses. All are protected by conservation easements either before or upon commencement of mitigation.
- **State wetlands, as currently (May 1, 2008) defined by California -** California's wetland policy states "no net loss in the short-term and an increase in wetlands in the long-term." CA wetlands are defined as "land where the water table is at near, or above the land surface long enough to promote the formation of hydric soils or to support the growth of hydrophytes, and shall also include types of wetlands where vegetation is lacking and soil is poorly developed or absent as a result of frequent drastic fluctuations of surface water levels, wave action, water flow, turbidity or high concentration of salts or other substances in the substrate. Such wetlands can be recognized by the presence of surface water or saturated substrate at some during each year and their location within, or adjacent to vegetated wetland or deepwater habitats." (14 CCR 13577) While the definition may change, the EWG uses the current definition. See:

[http://ceres.ca.gov/ceres/calweb/wetlands/wetlands_management.html] and for GIS maps: [http://gis.ca.gov/catalog/BrowseRecord.epl?id=1507].

Category 2 Lands

Category #2 — Areas where existing restrictions are expected to limit potential renewable development (mapped as yellow areas)

- **BLM Areas of Critical Environmental Concern** (ACECs) – designated by BLM to protect and prevent irreparable damage to "important historic, cultural, or scenic values, fish and wildlife resources or other natural systems or processes, or to protect life and safety from natural hazards." Federal Land Policy and Management Act of 1976, § 103(a). Designation typically takes place during the land use planning process for a larger BLM-administered area and involves environmental review and public participation. One hundred forty-five such areas have been designated by BLM on the 15.2 million acres that it administers in CA.
- **Designated critical habitats for federally listed endangered and threatened species** – species are put on the federal list by the FWS following its determination that they are either in danger of extinction throughout all or a portion of their ranges ("endangered") or likely to become endangered in the foreseeable future ("threatened") according to criteria established by Congress, including impacts to habitat, overuse by humans, and disease or predation, 16 U.S.C. § 1533(a)(1), and more detailed regulatory criteria adopted by the agency, see 50 CFR § 424.14(b)(2). The designation process starts with a petition from either an agency or a member of the public and involves review and comment by the public, state and local governments and others. Designation is made solely on scientific grounds, without consideration of economic impacts. Designated critical habitats are areas "essential to the conservation of the species" and are based upon the "best scientific data available," 16 U.S.C. § 1533(b)(2), but economic impacts are taken into account. Around 80 critical habitats have been finally designated in CA, including habitats for fish.
- **Special wildlife management areas in West Mojave** – the West Mojave Resource Management Plan – adopted following completion of an environmental impact statement and public participation – established Desert Wildlife Management Areas (DWMAs) and Mojave Ground Squirrel Conservation Areas (MGSCAs) with rigorous protections. In particular, the plan makes both kinds of areas subject to a 1% cap on surface disturbance.[11] The cap in the ground squirrel areas is applicable to federal land only, while the cap in the former areas applies to lands managed by participating jurisdictions.
- **Lands purchased with private funds and donated to the federal government** – approximately 272,000 acres of former railroad lands in the Mojave Desert were purchased by The Wildlands Conservancy with private funds and donated to BLM between 1999 and 2004. Another 315,000 acres that were donated are in parks or wilderness areas.
- **Proposed and potential conservation reserves in HCPs and NCCPs –** see definitions of HCPs and NCCPs above. These lands are also termed "softline reserves" and can be defined as requiring conservation measures of less than 100%.

[11] See West Mojave Final Environmental Impact Statement, Chapter 4, p. 4-21 (2d paragraph), p. 4-45 (3rd paragraph) (both cites to DWMAs), and p. 4-153, Table 4-49 (1st box) (ground squirrel), [http://www.blm.gov/ca/st/en/info/fed_reg_archives/2005/04/fedreg_availproposedwestmojaveplan.html].

Note: for Black & Veatch's analysis all HCP and NCCP conservation reserves were counted as Category 2 lands because the restrictions on development are unique to the individual plan and could not be assessed in detail for that analysis. However, the FWS will help the EWG categorize HCPs and NCCPs into hard and soft line reserves for the criteria 4 and 5 of the environmental ranking.

- **Lands specified as of May 1, 2008 in proposed wilderness bills** – two bills are currently pending: Boxer Statewide Wilderness Bill (S. 493), and the Riverside County Wilderness Bill (H.R. 3682). The majority of the areas proposed for wilderness designation in these bills lie in Category 1 areas. Areas proposed for wilderness designation in these bills that are not in Category 1 areas have been placed in Category 2.

Agricultural Lands

The issue of potential energy development on agricultural lands is perhaps the most controversial issue facing the RETI. California has long-standing policies to protect agricultural land such as the Williamson Act. In addition, California has policies promoting renewable energy development which underlie the RETI process. These policies clearly conflict when potential conversion of agricultural lands to non-agricultural energy development is considered.

Concerns were raised about the identification by Black & Veatch of proxy projects on private property generally and on agricultural lands specifically.[12] Agricultural lands may be highly valued for renewable development, particularly for solar facilities. The EWG has striven to ensure that the identification of CREZs is consistent with state and local law and policies, including protection of agricultural lands such as:

1. The Williamson Act –authorizes private landowners to contract with counties and cities to voluntarily restrict land to agricultural and open-space uses. The vehicle for these agreements is a rolling term 10 year contract. Not all counties participate in the program. Currently 16.9 million acres are enrolled in the program. Government Code section 51200 *et seq*.

2. Planning and Zoning Law – The Legislature intends for cities and counties to conserve open space whenever possible, including productive agricultural land. Government Code 65562

Agricultural land is designated and mapped in California among the following categories: prime farmland, farmland of statewide importance, unique farmland, farmland of local importance and grazing land. Together those designations total approximately 29 million acres as of 2004.

In some instances renewable generation facilities may be compatible with agricultural uses. Solar facilities, however, require significant acreage and take the affected land completely out of production. The issue to be resolved is which categories of agricultural lands should be screened out as ineligible for proxy projects for consistency with state law and policy regarding preservation of agricultural lands. The EWG agreed that the draft report would treat prime farmland under Williamson Act contracts as Category 2 land and exclude proxy projects. Proxy projects may be identified on other Williamson Act farmlands but the EWG instructed Black & Veatch to recognize that existing contracts are likely to limit development for 9 years or more.

[12] See Black & Veatch Phase 1B Report: [http://www.energy.ca.gov/reti/documents/index.html].

No consensus was reached as to whether a different screen for proxy projects should be used in the future. The fundamental policy issue is what assumptions should be made regarding future conversion of certain agricultural land to renewable energy production. This policy issue cannot be resolved by the EWG. However, since some of the best solar energy resources are found on lands currently used for agricultural purposes, resolution is of the utmost importance to future renewable energy development.

The EWG urges that the issue of assumptions regarding conversion of certain agricultural lands to energy development in the context of RETI be addressed by the SSC and guidance provided to the EWG for future consideration.

Water Issues

Electric generation from thermal power plants is most efficient when a source of cooling is available to remove waste heat in the thermal cycle. When available, water is commonly used to remove this heat and boost plant efficiency. Unfortunately, California's supplies of cooling water are limited, especially in arid regions where sunshine is most abundant. Moreover, California policy discourages the use of pristine water for power plant cooling.[13] The geographical and policy limitations on the use of water conflict with the goal of generating electricity from renewable energy resources most efficiently. The EWG was asked to provide guidance to Black & Veatch and the SSC on the use of water in the CREZ assessment.

The EWG assumes that groundwater is unlikely to be available for cooling thermal power plants, and that treated urban wastewater can be used. The EWG advised Black & Veatch to assume that solar projects within 10 miles of populated areas would have access to waste water suitable for cooling. It is assumed that for each 7,000 people, enough recycled water will be available to cool a 100 MW solar thermal plant.

Rating Methodology—Criteria, Data Sources, and Rating Formulas

This section describes the criteria used by the EWG to estimate the environmental impacts of potential energy development in CREZs. Sources of data used to evaluate the criteria are provided, together with the formulas used to quantify the potential environmental impacts associated with each criterion. Before the EWG issues its final ranking, it will test the proposed ranking methodology to ensure that results are reasonable.

#1 Energy Development Footprint

The amount of land needed for renewable energy collection and electric generation, the development "footprint," is one useful measure of the expected impact on the environment. Since this area also helps determine the energy output, the CREZ footprints have been normalized for annual energy output.

Data Source — Black & Veatch are developing estimates of the development footprint for each CREZ considered, and the EWG will use the same estimates. Black & Veatch also will estimate the annual energy output for each CREZ.

Rating Formula Inputs — Areas directly impacted by energy development, including access roads (acres): Annual energy production (GWh/yr).

Rating Formula — [Acres of footprint] ÷ [Annual energy output]

#2 Transmission Footprint

The amount of land on needed for new transmission rights-of-way (ROW), the transmission "footprint," is a second useful measure of the expected impact on the environment. As in Criterion #1, the area of new ROW has been normalized for annual energy output.

[13] CEC policy.

Data Source — Black & Veatch are developing estimates of new transmission rights-of-way for each CREZ, and the EWG will use the same estimates.

Rating Formula Inputs — Areas of new transmission ROW (acres). Annual energy production (GWh/yr).

Rating Formula — [Acres of new ROW] ÷ [Annual energy output]

#3 Land Disturbance

The EWG agreed that energy development on lands already disturbed by previous human activity is preferable to development in more pristine areas and struggled to come up with a criterion which would give preference to CREZs on disturbed lands. The group came to the consensus that reclaimed mine lands and brownfields should be considered as disturbed lands but could not agree on whether at least some agricultural lands should be included in this category. Because important solar resources are located on lands currently used for agriculture, the EWG requests that the SSC decide whether some agricultural lands should be considered disturbed and if so, which ones.

#4 Sensitive Areas in CREZs

A CREZ includes areas of potential renewable energy development but may also include sensitive areas in which development is restricted or prohibited (mapped as yellow or black areas.) The amount of sensitive land inside CREZ boundaries provides a measure of the extent to which potential energy development may impinge on the values being protected in the sensitive lands.

Evaluating this criterion is complicated by the fact that some CREZs are comprised of widely dispersed areas in which energy development is expected. Sensitive lands inside these CREZs may be a considerable distance from potential development and relatively unaffected by development. These CREZs have been subdivided into “sub-CREZs,” areas in which potential energy projects are more compact, and the ranking scores of the sub-CREZs will be averaged to obtain a score for the complete CREZ.

Data Source — The area of Category 1 and 2 lands within each CREZ (or sub-CREZ) is provided by Black & Veatch.

Rating Formula Inputs — Area of Category 1 and 2 lands in CREZ or sub-CREZ; annual energy output.

Rating Formula — [Area of Category 1 & 2 lands] ÷ [Annual energy output]

#5 Sensitive Areas in CREZ Buffer Areas

Potential impacts associated with energy development do not disappear at CREZ boundaries. Thus, energy development in areas remote from sensitive lands is preferable to areas in proximity to these lands. The EWG has determined that lands within 2 miles of a CREZ boundary may be affected by development in the CREZ. This criterion therefore is scored on the amount of Category 1 and 2 lands within 2 miles of a CREZ (or sub-CREZ) boundary.

Data Source — Areas of Category 1 and 2 lands within 2 miles of CREZ (or sub-CREZ) boundaries is provided by Black & Veatch.

Rating Formula Inputs — Areas of Category 1 and 2 lands within 2 miles of CREZ (or sub-CREZ); annual energy output.

Rating Formula — [Areas of Category 1 and 2 lands within 2 miles of CREZ] ÷ [Annual energy output]

#6 Significant Species

State and federal policies identify species of wildlife that are of significant concern. The threat that development may pose for these species must be addressed when siting projects. For purposes of rating CREZs, this criterion gives preference to CREZs in which fewer significant species are known to occur.

Data Source — California significant species database, DFG.

Rating Formula Inputs — Number of significant species in CREZ or sub-CREZ

Rating Formula — Number of significant species in CREZ or sub-CREZ

#7 Wildlife Corridors

In recent years, biologists have recognized the importance of the integrity of wildlife corridors that enable animals to move as needed from one habitat to another. These corridors, including floodways and riparian areas, are expected to become especially important as habitat changes in response to changing climate. Unfortunately, these corridors are not well understood and existing data is preliminary. Nevertheless, the importance of this criterion is such that the EWG has included it to give preference to those CREZs that minimize conflicts with wildlife corridors. **Data Source** — DFG

Rating Formula Inputs — Miles of known wildlife corridors in CREZ (or sub-CREZ); annual energy output.

Rating Formula — [Miles of known wildlife corridors in CREZ] ÷ [Annual energy output]

Visual Impacts

The visual impact of energy development and associated transmission facilities is of paramount importance to the public. The EWG therefore examined the possibility of including a rating criterion to evaluate the significance of scenic impacts for each CREZ. The scenic quality of some areas has been rated by relevant land management agencies, such as the BLM. Unfortunately, similar data is unavailable for all areas of the state, and the EWG reluctantly dropped the visual impact criterion from consideration for purposes of this report. The EWG notes that although not included in this statewide comparison of CREZs, visual impacts of individual energy and transmission projects must be thoroughly addressed when these projects undergo review in the siting process.

The absence of a visual impact criterion in the present CREZ rating methodology should not be interpreted as an indication of its unimportance. The decision not to consider visual impacts in this report was made solely because adequate statewide data was unavailable for this report.

The EWG recommends that consistent statewide scenic quality data be developed so that visual impacts can be included as a rating criterion in future updates of the EWG's work.

Native American Cultural Impacts

Another issue considered by the EWG for CREZ rating purposes was the potential impact of energy development on Native American cultural sites. Relevant data are available statewide from the Native Cultural Heritage Association. Unfortunately, these data are not centrally located nor in a format that was readily accessible for EWG purposes. Moreover, it remains unclear how the data could be used to provide a meaningful measure of the potential impact of energy development on cultural values. The EWG therefore reluctantly dropped cultural impacts from consideration in this report. As with visual impacts, this decision in no way reflects on the importance of these impacts, which are thoroughly considered in energy project siting cases.

The EWG recommends that data on Native American cultural sites be collected and formatted for ready access, and that a methodology be developed for inclusion of potential impacts on these sites be developed, so that this criterion can be included in future updates of EWG work.

United States Forest Service Lands

The EWG did not arrive at a consensus for considering potential renewable energy development on United States Forest Service (USFS) lands. This is in part because the USFS's renewable energy policy has not been settled. The land management plans of the four Southern California forests were recently updated, and certain land use zones were deemed "suitable" for "Renewable Energy Resources" activity, but these plans are now the subject of litigation.

In order to move forward, the EWG directed Black & Veatch to treat USFS lands not in Category 1 as Category 2. Black & Veatch will thus limit potential development on USFS lands in California to "pre-identified projects" for energy testing and/or development on USFS lands. The EWG also requested, however, that Black & Veatch provide the SSC and policymakers with information regarding the nature of the renewable resources that this Category 2 treatment eliminates from consideration.

The EWG recognizes that the USFS is currently considering adopting various guidelines for renewable energy development. Final adoption of such guidelines may warrant reconsideration of the approach taken here.

Ranking Scores

Each CREZ is given a relative score between 1 and 5 for each criterion. These scores are assigned on the basis of the percentage quintile in which the raw score provided by the rating formula lies. That is, the 20% of the CREZs with the lowest rating value for a criterion are assigned the score 1. The second lowest 20% are assigned the score 2, and so forth**.**

To obtain a total score for each CREZ, the individual scores for each criterion were added. Lower total scores are associated with CREZs in which potential environmental impacts are expected to be least, and higher scores indicate the likelihood of more severe environmental impacts. Total scores may range from 7 to 35 and will be reviewed for reasonableness.

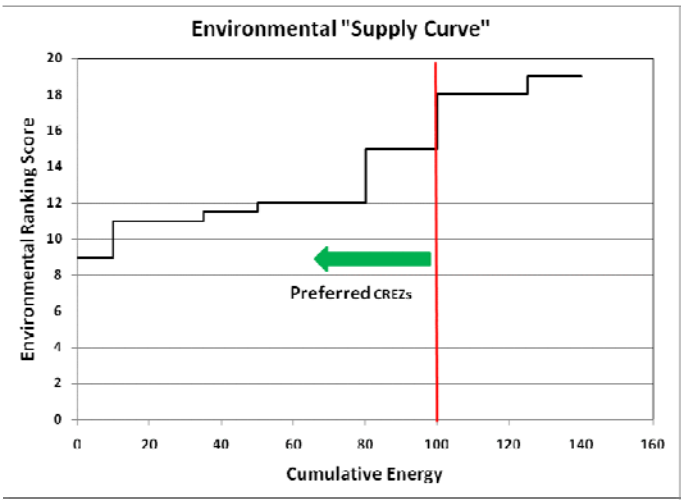
In its next report, the EWG will provide a table listing each CREZ, its expected annual energy output, its score for each criterion, and the total score. This list will be sorted by total score.

Environmental Supply Curve

The list of all CREZs considered, their annual energy output and their total ranking scores will be sorted from lowest score to highest. One can think of these scores as a measure of the environmental "cost" of energy development in each CREZ.

On the basis of the total scores, an environmental "supply curve" can be developed analogous to the economic supply curve developed by Black & Veatch,[14] as illustrated below.

[14] See Black & Veatch supply curve in Phase 1B Report:[http://www.energy.ca.gov/reti/documents/index.html].



CREZs identified as preferred for development must, at a minimum, provide the amount of renewable energy that must be developed to meet the state's goals. In addition, allowance must be made for the uncertainty in the estimates and the methodology used in the ranking process. Moreover, to promote competition between energy developers a surplus of energy potential is needed. These considerations have led to a determination that CREZs identified as preferred for development should provide approximately XXX GWh per year.[15]

This value is indicated on the supply curve as the vertical red line. Those CREZs identified by EWG as preferred lie to the left of this line.

Integrating Economic and Environmental Rankings

Since economic costs and environmental "costs" are incommensurate, the proverbial "apples and oranges" problem, a methodology is required to identify those CREZs which *simultaneously* minimize economic costs to consumers and impacts to the environment.

All CREZs which have been identified as preferred for low economic cost *and* for low environmental impacts on the basis of the two supply curves, i.e. those CREZs which pass both the economic and environmental screens, are deemed to merit consideration for transmission access in Phase 2 of the RETI process. In its next report, those CREZs will be identified.

In addition, a methodology will be developed for prioritizing additional CREZs needed to provide the state's energy needs which pass the economic screen but not the environmental screen, or *vice versa.* This methodology and the complete list of preferred CREZs will be included in a subsequent report.

Conclusions

Despite limitations, the methodology developed by the EWG and approved by the SSC described here provides a coherent and consistent means of estimating the relative environmental impacts associated with potential energy development in the CREZs identified by Black & Veatch. In addition, it enables economic and environmental considerations to be integrated through the dual supply curve approach.

This report describes the methodology developed by the EWG for ranking CREZs which minimize expected impacts to the environment, but does not include the results. The environmental ranking process will be completed by the EWG, and the results are scheduled to be reported September 5, 2008.

[15] See Black & Veatch choice of energy cut-off in Phase 1B Report: [http://www.energy.ca.gov/reti/documents/index.html].

The next report will also identify CREZs in which renewable energy development is expected to minimize both economic costs and environmental impacts. CREZs identified as preferred in both the economic and environmental ranking will be considered for transmission access in RETI Phases 2 and 3. In addition, a methodology will be developed to identify the remaining CREZs needed to meet the state's energy goals which pass one screen but not the other. All the CREZs to be considered in Phases 2 and 3 will be identified in the next report if time allows.